

Handhelds for Music Education

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Abstract: The purpose of this project was to gauge a music population's awareness of music tools or applications on handhelds which could be useful for music education, and also to gauge what kind of instructive information about the use of such tools or applications could be useful for this group. A questionnaire for volunteer participants was employed. Also some participants were interviewed. After that, a needs assessment was constructed to investigate the participants' needs. The study found that approximately 52 % of the participants responded that they had heard about such music tools or programs on handhelds which could be useful for music education, and about 29 % of the participants responded that they had used such tools or programs. About 76% of the participants were positive in responding that they thought music related tools or programs on handhelds helped them learn music.

Introduction

Music education is beneficial for the development of human beings. Learning music teaches people many skills, such as the ability to pursue good quality work, the ability to be persistent towards reaching a goal, the ability to express oneself, and to communicate with diverse people. However, when people become adults, they tend to have many things to do in their lives, and have little time for developing or keeping up such musical skills. What if they could use handy tools and could take those anywhere? Would the opportunity to learn music while being mobile help?

Literature Review

From the years 2006 to 2008, handheld devices have become more developed and diffused. A number of reports show this increase during the two years 2006 to 2008. For example, there were some noticeable landmark events and news, such as the introduction of the first iPhone by Apple in 2007, and the introduction of iPhone 3G in July the following year, which was equipped with a faster computer than the original iPhone. Regarding the release of iPhone 3G in July 2008, Elmer-DeWitt (July 16, 2008) remarks, " iPhone profits: Apple cleared estimated \$330 million in three days " (the heading). "... at least 1 million iPhones sold over the first weekend " (§ 2).

The iPhone is not the only handheld which is in high demand. For example, Nightly Business Report, the TV news broadcasted by Public Broadcast Services, reports the increased number of BlackBerry users from the years 2006 to 2008 (NBR

Enterprises/WPBP2 , 2008, September 1). “ Go almost anywhere these days, and you will probably see someone using a BlackBerry. There are currently over 16 million users worldwide more than double the numbers of subscribers two years ago ” (NBR Enterprises/WPBP2 , 2008, September 1).

As handhelds have developed, many researchers have reported the effectiveness of the use of handhelds in education, writing that the use of handhelds facilitates teaching and learning in education when those are used in appropriate ways. For example, according to Burson and Figg (2005), handhelds help provide seamless technology integration into classroom for teachers. Handhelds make it possible for learning to occur anytime and anywhere, and give lifelong learning opportunities for students as well (Burson & Figg, 2005). According to Ferguson, Gado, and Hook (2006), students overcome their frustration during the process of learning by using a handheld. They concluded that handhelds could amplify learners' self-efficacy (Ferguson, et al., 2006).

In addition, there are many reports on the effective use of handhelds in music education in informal publications. For example, Porter (2004, September 1) describes “ Brandt Schneider, who teaches choir and band [in] Derby, Connecticut, received a Palm Educational Pioneer grant in 2001 to purchase handhelds for use in his music classes ” (PDAs in the Spotlight, ¶1). He further explains, “ Because each student in Schneider's class has a handheld with EbonyIvory software, they can practice their music independently and at their own pace, ... ” (PDAs in the Spotlight, ¶3).

However, although the effectiveness of handhelds has been demonstrated in many educational settings, there are issues which need to be taken into account. For example, Campbell, et al. (2005) suggest the need for setting up policies, procedures, and regulations regarding the use of handhelds. On the other hand, other reports show that the suggestion such as Campbell's might not be so easily done. For example, Adams and Angeles (2008) discuss that some schools ban bringing handhelds to school, but some schools take an opposite stance. They argue that the diversity and rapid change of handhelds makes it difficult to assess its use in classrooms.

Purpose of the Project and Project Description

Having accepted the information above, the project attempted to provide help for a music population whose ages ranged from teenagers to middle aged. Those people have many responsibilities other than playing, teaching, or learning music in their daily lives.

The purpose of this project was to gauge the music population's awareness of music tools or applications on handhelds which could be useful for music education, and also to gauge what kind of instructive information about the use of such tools or applications could be useful for this group.

The project provided a needs assessment to investigate the participants' needs. In order to assess their needs, first, the participants' awareness or knowledge levels of music related tools or programs on handhelds which could be useful for music education was

investigated. Next, it was examined if they were interested in looking at instructive information on the use of tools or programs on handhelds which would help users with music learning or teaching. Finally, what needed to happen regarding instructive information about such tools or programs for this group was investigated. Information covered was instructive information, which could be any informative information as well as instructional information that closely ties into education. By providing a needs assessment for this particular group of people, the project also attempted to help keep music alive.

Methods

Population

The participants of the project were various people who were associated with music and technology. Three groups of people were employed. The first group of participants were high school students and their teacher in a course called Computer Basics. The second group of participants were community college students and their teachers. The teachers had taught either one of the courses called Studio Production 1 or History of The Recording Industry, and their students had taken either one of the two courses or both. The third group of participants were graduates from higher education institutions who had worked in a company which deals a lot with technology, such as computers, studio equipment, and so on.

Level of knowledge and skills regarding music and technology. The level of knowledge and skills of all the participants regarding music and technology were varied. For example, some of the students in the community college were already music practitioners although they had taken the course as a student. On the other hand, some students were not music practitioners, or had not intended to be music practitioners, however they had taken the course because they simply would like to learn more about the subject. Most of the participants were likely to have some musical skills or knowledge, and most of them were likely to be familiar with some technology applications for music in general as well as music education.

Ethnic background. The ethnic background of the participants was varied, such as Asians, Pacific Islanders, Caucasians, mixed ethnicities, and so on. However, they have all lived in the U.S. although some of them might not have been born here. Some people were local, and some come from other places.

Rationale for the selection of the participants. The participants were selected as the subjects of the project because of their knowledge skills, and activities. All the people above were unlikely to be novices in music and many of them were familiar with some technology applications for music education. Whether they were music practitioners or not at the time of the study, many of them were potential music educators, and already familiar with some technology applications for music education. In order for the project to achieve its purposes, subjects were selected based on their experience in environments including technology as well as their aptitudes in music.

Procedures

All 21 participants were asked to fill out a questionnaire. This questionnaire was taken mostly to gather quantitative data, but some qualitative data also was collected. It took about 15 minutes for the participants to fill out the questionnaire.

After that, of the 21 participants, 2 people volunteered for answering individual interviews. These individual interviews were conducted in order to gather more qualitative data. For the purpose of collecting as honest a voice as possible, it was conducted individually instead of as a group. The interviews were taped for the purpose of the collection of accurate data. The estimated time it took for each interview was about 10 to 15 minutes, however, one of the actual interviews took much more time due to the willingness of the participant to share his or her knowledge and opinions.

Instruments

The questionnaire consisted of 18 questions. Of that, there were seven multiple choice questions, nine short answer questions, and two open-ended questions to gauge further explanations for their choices to the answers for the multiple or short answer questions. For the high school students, a slightly modified version of the questionnaire was employed from the questionnaire which was used for the community college students and teachers, and the participants who were graduates of higher education institutions. The reason for that was to take into consideration the level of comprehension of complex expressions on the questionnaire by the high school students.

Regarding the individual interviews, the questions were outlined previously, however, probing questions were asked as follow-up.

Sites

The questionnaire was implemented and collected in the technology classroom at the high school and the distance learning classroom at the community college. For the participants who were graduates of higher education institutions, the questionnaire was filled out in their home, and was returned to the investigator in a few days.

The two individual interviews with separate participants were conducted during daytime. One interview was at one of the participant's school, and the other interview was at the participant's company.

Consent

Since the project involved high school students who were under 18 years old, parental consent was obtained for the minors' participation. In addition, all the participants were asked to sign an Informed Consent Form, that explained the study, who the investigator was, voluntary participation, confidentiality and anonymity of the participants'

information, contact information of the investigator as well as the Institutional Review Board at The University of Hawai'i. This procedure took place before the implementation of the study of the participants in order to ensure their safety during participation in the study.

Results

Demographics Information

The data was taken from the three groups of participants: students and a teacher in a high school; music students and their teacher in a community college; and graduates from higher education institutions who had worked in a company. Due to only the small number of high school students who participated in the project, most of the data was collected from people over 18 years old and who were considered as adults.

The ages of the 21 participants ranged from 16 to 56. Of those, 8 participants were in their teens; 6 participants were in their 20's; 4 participants were in their 30's; and 3 participants were above 40.

Percentage of the Participants who had Handhelds

The data showed that about 76 % of the participants responded that they had a handheld device with more functions than a basic cellular phone.

How Handhelds Were Used by the Participants

For the question, how they had used their handhelds, about 38 % of the participants responded that they used their handheld devices to listen to music. About 19% of the participants described using a "Calendar" on their handhelds. Also, about 19 % of the participants pointed out the usage of their handhelds as a communication device, such as for e-mail, other kind of text messages, phone calls, or updating "facebook" to communicate others online. Other uses of the handheld devices by the participants included using "to do list," note taking, checking movie times and places, stocks, or weather reports, playing games, Internet browsing, playing a virtual piano, taking photos, sharing files, finding recipes, using their handheld as a map, calculator, dictionary, or voice recorder.

Participants' Awareness of Tools or Programs on Handhelds for Music Learning

If the participants had heard about the tools or programs on handhelds which were useful for music learning? For the question, if they had heard about the tools or programs on handhelds which were useful for music learning, about 52 % of the participants responded that they had heard about such tools or programs on handhelds.

If the participants had used the tools or programs on handhelds which were useful for music learning? For the question, if they had used the tools or programs on handhelds which were useful for music learning, about 29 % of the participants responded that they had used such tools or programs on handhelds devices.

What kinds of music related tools or programs on handhelds had been used by the participants? As for the kinds of music related tools or programs they had used, about 19% of the participants stated that they used a tuner such as for the guitar or ukulele, and about 14% of the participants stated that they used a metronome. Other music related tools or programs used by them on the responses included Internet access for song chords, “ iTouch Game ” which could be used on iPod, and “ Finger Piano ” and “ Piano Chords ” on iPhone.

Handhelds as a Music Learning Tool

If the participants had thought the music related tools or programs on handhelds helped them learn music? For the question, if they had thought the music related tools or programs on handhelds helped them learn music, about 76% of the participants were positive in responding that they thought those music related tools or programs on handhelds helped them learn music.

The reasons the participants thought music related tools or programs on handhelds helped them learn music. Overall, there were two types of reasons they thought those music related tools or programs on handhelds helped them learn music. One of the reasons had to do with functionalities of handheld devices, and the other reason had to do with functionalities of the music related tools or programs.

With respect to the reasons which had to do with the functionalities of handhelds, “ convenience ” was frequently pointed out among the participants for one of the reasons that they thought those music related tools or programs on handhelds helped them learn music. About 19% of people wrote down the word, “ convenient ” or “ convenience.” Other reasons included “ easily accessible,” “ portable,” “ mobile,” “ user-friendly,” “ personal,” “easy to share,” and “ easy to download and install [the programs or tools].”

Other comments stated by the participants were that music development had to do with “ repetition,” and music tools or programs on handhelds would allow users to have “ repetition ” of practice or retrieving information. Related to that, there was a comment which pointed out “ frequency.” Some comments stated that handhelds allowed user to have more frequency of practice, retrieving or finding information. For example, there were comments which were “ I learn more music and songs easier on programs [on handhelds] than finding it myself,” “ Music hands-on on demand,” and “ ...music production related abilities in the hands of more people...” About 19% of the participants pointed out about “ mobility ” or “ portability ” by describing that for example, “ It would also be good if you commute on a bus or train,” and “ ...if creativity strikes while you're not at home or in the studio, you have something on hand to let that creativity out.”

Regarding the reasons which had to do with the functionalities of the music tools or programs on handhelds, they commented that for example, “ Tuning can be identifying pitches,” “ A keyboard for writing songs..,” “ ...a metronome can definitely help you to stay in timing...,” and “ helps you to train your ear on listening.”

Some negative comments for the use of handhelds in music education. Despite overall positive comments stated above regarding the use of handhelds for music learning, there were some negative comments as well. For example, “ The handheld device is very limited in components [such as those in] a computer, or professional hardware,” “ ...the extent would depend on individual motivation to engage uses of the program.” Related to those comments, one interviewee pointed out about “ different kinds of learners ” and for him or her, handhelds would not help learn music because he or she would do much better with real human assistance for learning music.

Instructive Information for Handhelds in Music Education

Were the participants interested in looking at instructive information? For the question, if they were interested in looking at information on the use of tools or programs on handhelds which would help users with music learning or teaching, about 67% of the participants responded that they would like to look at such information. On the other hand, about 5% of the participants were not interested in it, about 19% of the participants responded “ undecided, ” and about 5% of the participants left their responses as a blank.

What kind of information the participants were interested in looking at? The kind of information they would like to look at listed by the participants had three facets: technical aspects; information about the kinds of programs or tools which were available; and contents regarding music programs or tools.

Information they would like to look at from the technical aspects included “ operating system,” and “ compatibility with handhelds and computer.” Information they would like to look at about the kinds of programs or tools which were available included “ features,” “ prices,” “ Locations of sites for more applications. “ ...program descriptions, and links to download and purchase,” “ Types of applications,” “ Current review of products and applications,” and “ ...range of guitar tuners.” With respect to contents of music tools or programs, they described for example, “ music chords,” “ theory,” “ ear training,” “ notations,” recording ” “ ... how to use certain instruments,” and “... a feature that will have audible teaching for each chord.”

What kind of instruction would be useful? For the question, “ To help learn about music applications on handheld devices what kind of instruction would be useful? ” about 57% of the participants explicitly stated “ web-based instruction,” and about 30% of the participants stated “ multimedia instruction.” Even though there were other preferences for different kinds of instruction, such as paper-based, workshop, and so on web-based instruction and multimedia instruction proved to be popular among the participants.

What type of medium for the information would be helpful? For the question, “What type of medium would help you learn about music applications on handhelds?” even though there were different kinds of preferences among the participants, two mediums were outstandingly popular among them: “interactive learning, program, or video,” and “video.”

About 52% of the participants wrote the word, “interactive” claiming some sort of interactive programs or tools for self-learning would be helpful. About 48 % of the participants pointed out “video” as a medium which would help their learning.

Related to this collective response among the participants, one of the interviewees who claimed handhelds would not be the best tool for the learner such as him or her to learn music since he or she preferred to have human assistance, pointed out about the use of video as an instructional tool as well. This person stated that as handhelds become more advanced, having a video on the handheld would make it easier to learn music, such as playing the piano for the kind of learner such as him or her. The reason was because the learner could watch what the instructor was exactly doing on the video, and mimic the action. The interviewee also added that if the video was on his or her own handheld device, then he or she was able to pause the video to make sure what he or she was doing was correct.

Needs Assessment

Below is the needs assessment which was constructed based on the compilation of the data from the questionnaire and individual interviews. The needs assessment was constructed based on the majority opinions of the participants.

To investigate the participants' needs, the categories, “What Is” and “What Should Be,” were analyzed from two aspects as is shown in Figure 1 below: “Learner Status” and “Strategies to Increase Utilization of Tools or Programs on Handhelds for Music Education.”

	What Is	What Should Be
Learner Status	<ul style="list-style-type: none"> • More than three-quarters of the participants had a handheld. • More than half of the participants were aware of tools or programs which could be useful for music education. • More than three-quarters of the participants thought music related tools or programs on handhelds would be useful for learning music. • Despite those responses above, overall, they were not utilizing the tools or programs very much. 	<ul style="list-style-type: none"> • Handhelds which have music related programs or tools should serve as convenient tools to increase the frequency of musical practice, or also help with retrieving, inputting, and searching for information while being mobile. • Utilizing the programs or tools which could be useful for music education to help maximize their learning time during their busy lives.
Strategies to Increase Utilization	<ul style="list-style-type: none"> • Currently, there is not much instructive information regarding music related tools or programs which could be useful for music education. 	<ul style="list-style-type: none"> • More information should be available to them in a format or medium which is accessible and useful for them, such as web pages, multimedia, interactive materials, and videos. • More information which has three facets: technical aspects; information about the kinds of programs or tools which are available; and contents regarding music programs or tools. • More information showing examples of how others have utilized tools or programs on handhelds which could be useful for music education in order to get ideas about how those tools or programs will be useful in varied situations for music education.

Figure 1. "What Is" and "What Should Be."

What Is: Regarding Learner Status

As it is indicated in Figure 1 above, many of the participants had a handheld, were aware of tools or programs which could be used for music education, and thought those tools or programs could help with learning music. However, overall, those tools or programs were not utilized on a regular basis.

What Should Be: Regarding Learner Status

Handhelds which have music related programs or tools should serve as convenient tools to increase frequency of musical practice, or also help with retrieving, inputting, and searching for information while being mobile. The participants could utilize the programs or tools which can be useful for music education on a regular basis to help them maximize their learning time in their busy lives. (See Figure 1.)

What Is: Regarding Strategies to Increase Utilization of Tools or Programs on Handhelds for Music Education

As it was indicated in Figure 1 above, currently, there is not much instructive information regarding music related tools or programs which could be useful for music education, for example, how others have utilized such tools or programs on handhelds for music education.

What Should Be: Regarding Strategies to Increase Utilization of Tools or Programs on Handhelds for Music Education

To increase utilization of tools or programs for music education, more instructive information needs to be available to the participants in a format or medium which is accessible and useful for them, such as web pages, multimedia, interactive materials, and videos. The information needs to include three facets: technical aspects; information about the kinds of programs or tools which are available; and contents regarding music programs or tools. In addition, more information which shows examples of how others have utilized such music tools or programs on handhelds for music education should be publicized so that they can get ideas about how those tools or programs will be useful in varied situations for music education. (See Figure 1.)

Gap

A gap exists between “ What Is ” and “ What Should Be.” There is not a sufficient amount of accessible instructive information about such innovative tools or programs on handhelds. Therefore the utilization of such tools or programs on handhelds is difficult to discover.

End Product

As an end product of the project, a website was created: <http://www.yukipage.net/> The information on the web page includes a needs assessment, and examples showing how music tools or programs on handhelds could be utilized for music education. Figure 2 below shows the screenshot of the home page of the website.

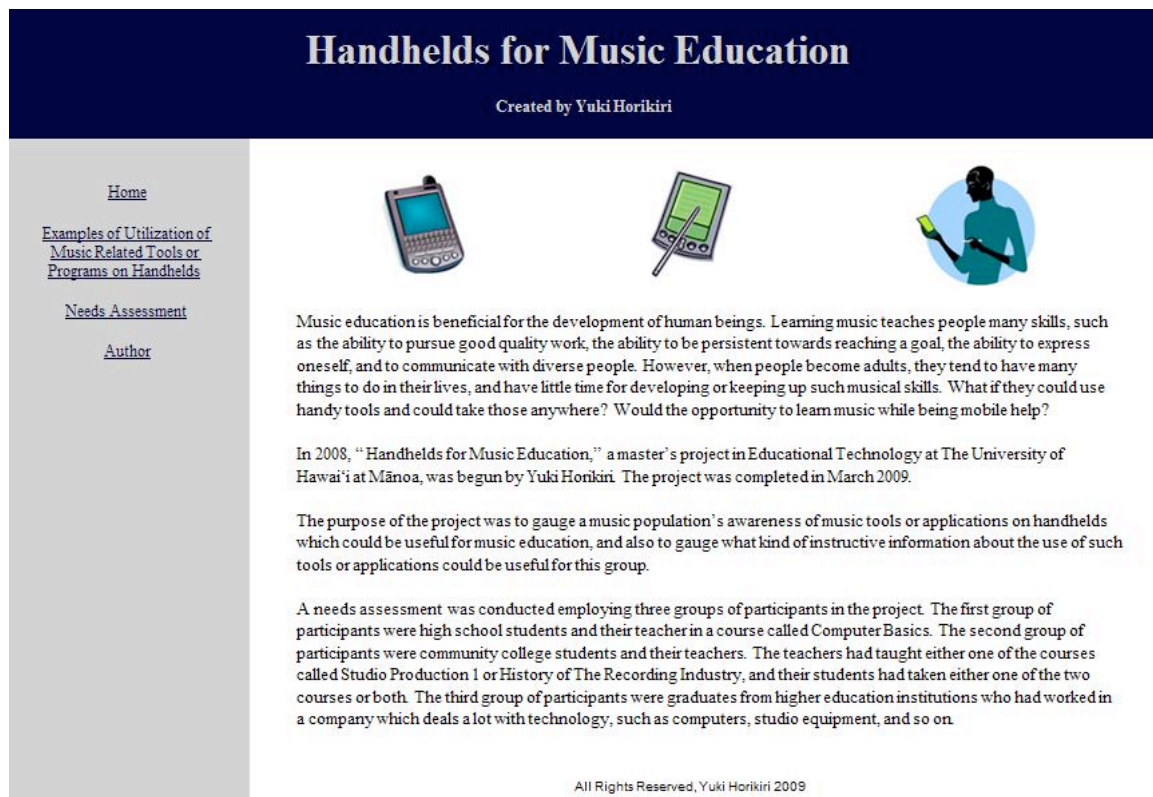


Figure 2. View of Yuki's home page.

Conclusions

The questionnaire found that more than three-quarters of the participants had a handheld. With respect to the participants' awareness or knowledge levels of music related tools or programs on handhelds which could be useful for music education, it found that more than half of the participants had heard about such music tools or programs, and more than one-quarters of the participants had used such tools or programs.

More than three-quarters of the participants were positive in responding that they thought music related tools or programs on handhelds helped them learn music, and more than half of the participants were interested in looking at instructive information about such tools or programs.

However, currently, there is not much instructive information regarding music related tools or programs which could be useful for music education. The needs assessment assessed a gap exists between "What Is," the current situation, and "What Should Be," the ideal situation, which is that there is not a sufficient amount of accessible instructive information about such innovative tools or programs on handhelds. Thus the utilization of such tools or programs on handhelds is difficult to discover.

As handheld devices improve, and the number of users increases, substantial instructive information for music related tools or programs which could be useful for music education should become more widely available. That will help a music population, such as the participants in this study, to better take advantage of those devices.

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